Vol. 33 No 10

BULLETIN

OF THE

TORREY BOTANICAL CLUB

OCTOBER, 1906

New species of Uredineae — V

JOSEPH CHARLES ARTHUR

The following new species are presented as the result in part of critical study of general herbarium material and in part of recent collections kindly sent by the collectors or otherwise communicated. For the new material I am indebted to Messrs. E. W. D. Holway, P. H. Rolfs, C. F. Baker and Ernst A. Bessey, and extend hearty thanks for the same. The species come from various parts of western Canada, western and southern United States, Mexico and the West Indies. The assortment of species is more than usually interesting, as it embraces some belonging to little-known genera, and some that clarify knowledge of common forms.

In the preceding number of this series occur two errors needing correction. *Puccinia Dolichi* (Bull. Torrey Club **33**: 28) is an unwarranted name. Only the uredinia of the description belong to the species, the teliospores being yet unknown; but as the rust is on a leguminous host, they are more likely when found to belong to *Uromyces* than to *Puccinia*. The teliospores of the description, as pointed out recently by the collector, were stray spores from some Mexican euphorbiaceous plant transferred to the Cuban specimens by means of the drying papers. Until the teliospores are discovered it might be well to call the Cuban rust on *Dolichos*, **Uredo Dolichi.**

The second error is orthographical, and requires the substitution of *o* in place of *a* in the new generic name (*loc. cit.* page 30),

[The BULLETIN for September 1906 (33: 455–512) was issued 5 O 1906.]

which should read *Cerotelium*. The derivation is from *κηρός*, wax, and *telium* (from *τέλος*).

There are also errors in the recent paper on "North American species of *Peridermium*," by Arthur and Kern, published in the August number of this journal, which might be pointed out here. The host of *Peridermium Holwayi* (*loc. cit.* page 431) proves to be *Abies lasiocarpa* (Hook.) Nutt. This was ascertained by Professor Holway, who visited the type locality in August of this year in company with Mr. F. K. Butters, who knows the trees of the region well, and found that there can be no question regarding the error in the original determination. *Abies lasiocarpa* and *Pseudotsuga mucronata* have a similarity of appearance which makes it quite easy to mistake one for the other. It was found, however, that while the *Abies* is abundant in the type locality, the *Pseudotsuga* is entirely absent, although it does occur on slopes of the same mountains at a lower altitude. As no *Peridermium* has yet been correctly reported on *Pseudotsuga*, the lines referring to this host on page 411 should be cancelled, and the species with its corrected host transferred to the top of the next page to follow *P. pseudo-balsameum*. In the first column of the table, on page 405, *Abies* should be substituted for *Pseudotsuga*. Besides this, there is an erroneous citation of a host under *Peridermium Cerebrum*. On page 424 the three lines referring to *Pinus ponderosa* should be stricken out.

Uromyces Eleocharidis sp. nov.

II. Uredinia amphigenous, scattered, oblong, 0.3–1.5 mm. long, tardily dehiscent by one or more longitudinal slits, dark cinnamon-brown; urediniospores oblong to broadly oval, 15–19 by 19–29 μ, wall golden-yellow, medium thin, 1–1.5 μ, sparsely and finely echinulate; pores usually 3, approximately equatorial or super-equatorial.

III. Telia amphigenous, thickly scattered, oblong, 0.5–2 mm. or more long, tardily dehiscent by longitudinal slits, chocolate-brown; teliospores angularly obovate, truncate or rounded above, narrowed below, 16–22 by 27–45 μ, wall light chestnut-brown, medium thin, 1–1.5 μ, thicker above, 7–10 μ, smooth; pedicel tinted, about one to one and a half times length of spore.

On *Eleocharis palustris* (L.) R. & S., Aberdeen, South Dakota, September, 1897, *David Griffiths* (West American Fungi *no. 60a*,

type); Armstrong, Iowa, July 17, and August, 1886, *R. I. Cratty;* Rooks County, Kansas, December 7, 1894, *E. Bartholomew;* Racine, Wisconsin, October 27, 1901, *J. J. Davis;* Spirit Lake, Iowa, April 7, 1902, *J. C. Arthur;* Stockton, Kansas, March 7, 1906, *E. Bartholomew.* This rust has been known for some time, and has been listed under *Uromyces Junci.* It differs from that species, however, in a number of inconspicuous but positive characters. Comparing it with *U. Junci,* the dehiscence of the sori is brought about by longitudinal slitting of the overlying epidermis, and not by falling away of the epidermis, while the urediniospores are more inclined to oblong, with thinner walls, and a wholly unlike arrangement of the germ-pores. The teliospores are much alike in both species. When *Eleocharis* and *Juncus* stems are deprived of their upper and lower portions, as in most cryptogamic collections, they are quite similar in appearance, and not infrequently misnamed. They can be distinguished, however, by a cross-section of the stem, which in *Juncus* will show a rather uniform central pith, and in *Eleocharis* a number of large lacunae.

Uromyces insularis sp. nov.

II. Uredinia amphigenous, scattered, small, round, 0.1–0.4 mm. across, soon naked, dark cinnamon-brown, ruptured epidermis noticeable; urediniospores globoid, 19–23 by 23–25 μ, wall golden-brown, 1–1.5 μ thick, sparsely echinulate with conical points about 3 μ apart; pores 3, equatorial.

III. Telia amphigenous, scattered or oval, 0.2–0.8 mm. across, soon naked, light cinnamon-brown, ruptured epidermis noticeable; teliospores broadly lanceolate, rounded or obtuse at both ends, 15–18 by 29–39 μ, wall golden-yellow, thin, about 1 μ, apex usually bearing a hyaline umbo, 3–7 μ thick; pedicel hyaline, short, deciduous.

On *Clitoria cajanifolia* (Presl) Benth., near Dorado, Porto Rico, May 19, 1887, *I. Urban.* This species was found on sheet *no. 80339* of the phanerogamic herbarium of the Field Columbian Museum. Thanks are due the officers of the Museum for their kindness in permitting the writer to examine the collection for rusts. The species is very unlike *Uromyces Clitoriae* Arth., from Mexico, which has ellipsoid teliospores with thick, verrucose walls.

Puccinia inflata sp. nov.

O. Pycnia hypophyllous, crowded in orbicular groups, punctiform, prominent, pale yellowish or brownish, subepidermal, irregularly globoid, 100–120 μ; sterigmata large.

II. Uredinia chiefly hypophyllous, scattered or gregarious, roundish, small, 0.1–0.3 mm. across, soon naked, somewhat pulverulent, cinnamon-brown, ruptured epidermis inconspicuous; urediniospores broadly obovate or ellipsoid, 21–25 by 26–33 μ, wall cinnamon-brown, medium thick, 1.5–2 μ, sparsely and sharply echinulate; pores 3 or 4, usually scattered, rarely equatorial.

III. Telia amphigenous, scattered or gregarious, roundish, small, 0.1–0.5 mm. across, soon naked, somewhat pulverulent, chocolate-brown, ruptured epidermis slightly evident; teliospores ellipsoid, 23–26 by 29–34 μ, rounded at both ends, slightly or not constricted at septum, wall chocolate-brown, uniformly thick, 4–5 μ, conspicuously reticulate, areolae 2–3 μ across; pedicel often attached more or less obliquely, colorless, once and a half to twice length of spore, with globose enlargement near the spore, which swells in water to 20–25 μ across.

On *Stigmatophyllon periplocifolium* (Desf.) Juss., Baracoa, Cuba, March 13, 1903, *E. W. D. Holway* (type); near Cayamas, Santa Clara Province, Cuba, October 13, 1904, *C. F. Baker 3538*. There is much similarity between this species and *Puccinia Echinopteridis* Holw. from Mexico. It has, however, smaller sori throughout, with more ellipsoid and smaller teliospores borne on longer and more slender pedicels. The surface-markings appear to be the same in the two species.

Puccinia Tridacis sp. nov.

O. Pycnia wanting.

III. Telia hypophyllous, numerous, small, 0.2–0.5 mm. across, scattered, or often gregarious and confluent in circinating groups 2–5 mm. across, early naked, ruptured epidermis inconspicuous, pulverulent, chestnut-brown; teliospores oblong or narrowly oblong, rounded or obtuse at apex, obtuse or narrowed at base, 13–17 by 40–58 μ, wall golden-brown, smooth, about 1 μ, thicker at apex, 6–10 μ, pedicel colorless, short, about one half length of spore.

On *Tridax procumbens* L., Punta Brava, Cuba, November 15, 1904, *Baker & O'Donovan 4039*. A leptopucciniaceous rust of the macroscopic appearance of *Puccinia Xanthii*.

Melampsora albertensis sp. nov.

II. Uredinia hypophyllous, numerous, scattered, round, 0.2–0.4 mm. across, early naked, pulverulent, pale-yellow, ruptured epidermis noticeable; paraphyses numerous, intermixed with the spores, clavate, 9–15 by 67–90 μ, wall colorless, 3–5 μ thick, smooth, stipe solid; urediniospores flattened laterally, when seen from the broad side broadly-elliptical, 16–19 by 23–27 μ, when seen from the narrow side oblong, 13–15 by 23–27 μ, wall colorless, 1.5–2 μ, much thickened on the flattened sides, 2.5–3.5 μ, evenly and sparsely verrucose-echinulate, without smooth spots.

III. Telia hypophyllous, numerous, small, irregular, often confluent, usually crowded in more or less extensive groups about the uredinia, subepidermal, waxy, orange-brown; teliospores prismatic, 10–13 by 29–39 μ, wall golden-brown, smooth, thin, about 1 μ, thicker above, 2–3 μ, with an evident apical germpore.

On *Populus tremuloides* Michx., Moraine Lake, Laggan, Alberta, Canada, September, 1906, *E. W. D. Holway*. An interesting species, being the second one on *Populus* recorded for America. It differs from the common species in the smaller urediniospores which have no smooth spot, and in having the teliospores slightly thickened above. The gross appearance of the fungus is also somewhat different.

Uredo biocellata sp. nov.

II. Uredinia amphigenous, scattered, round, large, 0.75–1.5 mm. across, subepidermal, without paraphyses or peridium, early naked, pulverulent, light chocolate-brown, ruptured epidermis noticeable; urediniospores broadly ellipsoid or obovate-globoid, 23–27 by 27–32 μ, wall light chestnut-brown, 1.5–2 μ thick, coarsely echinulate, depressed over the 2 opposite pores, but with the cuticle greatly inflated, nearly colorless, smooth, forming bullate areas 18–25 μ in diameter.

On *Pluchea purpurascens* (L.) DC., Florida Keys, 1898, *C. L. Pollard 143*. The inflated sides of the spores give them a conspicuously odd and distinctive appearance.

Uredo Holwayi sp. nov.

O. Pycnia hypophyllous, numerous, scattered, inconspicuous, subcuticular, pale-yellow, becoming brownish, frustum-like or sometimes columnar, 80–112 μ in diameter by 40–70 μ high.

II. Uredinia from a limited mycelium, hypophyllous, in two rows, on yellow spots occupying part or all of a leaf, subepidermal, roundish or oval, 0.1–0.3 mm. across, brownish-yellow, dehiscent by a small central orifice, ruptured epidermis not noticeable; peridium hemispherical, consisting of appressed hyphae, free at the orifice where they are 10–14 μ in diameter, with walls 3–4 μ thick; urediniospores borne singly on pedicels, broadly ellipsoid or obovate, 15–19 by 21–26 μ, wall nearly colorless, medium thick, 1.5–2.5 μ, strongly echinulate below with sharp points 1.5–2.5 μ apart, smooth above; pores obscure; contents orange-yellow when fresh.

On leaves of *Tsuga Mertensiana* (Bong.) Carr., Glacier, British Columbia, August 13, 1906, *E. W. D. Holway*. A unique rust for which no genus seems rightly constituted. It is physiologically an aecium, and possesses a peridium, but cannot be called *Aecidium* because the spores are borne singly on pedicels instead of being catenulate. In gross appearance it resembles an over-mature *Peridermium Peckii*, which has lost its protruding peridial cells. Its peridium, however, is not made up of distinct cells, as in *Peridermium*, but of compacted filaments, the ostiolar ends of which resemble paraphyses. The spores show considerable similarity to those of *Kuehneola*, and the pycnia also, but are still more like the pycnia of *Gymnoconia*. From these resemblances, the subcuticular pycnia, and other structural features, we may conclude that this is a heteroecious form, having Melampsora-like teliospores on some rosaceous host, or a host belonging to some small family. It may be furthermore assumed, in accordance with the general relationship pointed out by Tranzschel, that the telia will resemble those of the so-called *Chrysomyxa Abietis* on *Tsuga canadensis*, found in Massachusetts, and that the new genus will be closely related to *Pucciniastrum*.

Uredo Chaetochloae sp. nov.

II. Uredinia amphigenous, numerous, oblong to linear-oblong, about 0.1 mm. wide, 0.5–2 mm. or more long, soon dehiscent by a longitudinal rupture, dark cinnamon-brown, ruptured epidermis

conspicuous; urediniospores broadly ellipsoid, 21–29 by 29–42 μ, wall chestnut-brown, 1.5–2 μ thick, sparsely and strongly echinulate with sharp conical points about 3 μ apart; pores 3, equatorial.

On *Chaetochloa macrosperma* Scribn. & Mer., Miami, Florida, March 25, 1903, *E. W. D. Holway* (type); May 15, 1906, *Ernst A. Bessey 41*. The sori of both collections are black, due to a fungous parasite. No teliospores could be found. The uredinia resemble those of *Puccinia atra* D. & H., but the spores are larger with echinulate instead of verrucose surface.

Caeoma strobilina sp. nov.

O. Pycnia conicolous, preceding and among the aecia, arising beneath the cortical layers, flattened, in more or less continuous layers, 130–160 μ high.

I. Aecia conicolous, subcorticular, usually covering the entire surface, causing hypertrophy, the scales becoming solidly united and turning prematurely reddish-brown; peridium wanting; aeciospores narrowly ellipsoid or broadly lanceolate, rarely globoid or obovoid, often attenuate below, 12–19 by 29–50 μ, wall colorless, about 1.5 μ thick, rather coarsely verrucose, with a smooth spot at base.

On cones of *Pinus palustris* Mill., East Palatka, Florida, May 30, 1906, *P. H. Rolfs* (type); *Pinus Taeda* L., Dunedin, Florida, June 20, 1901, *S. M. Tracy 7324;* Lake City, Florida, May 30 and July 10, 1906, *P. H. Rolfs*. This species, which appears not to be abundant, has probably been overlooked from its habit of growth on the cones of high trees, where it is generally inaccessible. The specimens, on which this description is based, were sent by Professor Rolfs in fresh condition. To him and to Mr. H. S. Fawcett, who ascended the trees for the type material, thanks are due for their enthusiastic search for specimens. Professor Rolfs reports seeing diseased cones, presumably of this species, in South Carolina between Charleston and Florence, as he journeyed on the Atlantic Coast Line Railway. When the cones are dead and dry, they usually fall to the ground, but then are so wormeaten and abnormal in appearance as to give little suggestion of bearing a rust. Such was the specimen sent by Professor Tracy, which was found on the ground. The fungus usually penetrates the whole cone, causing it to become much enlarged and of a brick-red color,

being in strong contrast to the normal deep green of the immature cone. The scales of the cone become cemented together, and show no tendency to separate when mature and dry. After a time the sori open by breaking away the superposed tissues, and the whole surface is covered with the orange-yellow spores. As the cones become old and dry the powdery surface fades to white. There is no peridium, and consequently the species is not placed in the genus *Peridermium*. The species differs from *Caeoma conigenum* Pat., found in Mexico by P. Maury, in having spores with much thinner and less verrucose walls. There is much probability that these two species of *Caeoma* are the aecial forms of species of *Bubakia*, the rust on *Croton*. This is assumed from the fact that all known coniferous species of *Caeoma* belong to the *Uredinatae*, so far as their life histories have been ascertained. They have been previously collected only on leaves of *Abies* and *Larix* as aecia of species of the true genus *Uredo* (*Melampsora* of most authors). Two other American genera under this subfamily are known, *Physopella* and *Bubakia*, and of these the latter, judging by geographical distribution of its species, is the most likely to be associated with these species of *Caeoma* on *Pinus*, for the rust is so unlike those on *Abies* and *Larix* that it is not likely to belong to the same telial genus.

Aecidium Herrerianum sp. nov.

O. Pycnia hypophyllous, in small groups, 1 mm. or more across, surrounded by aecia, inconspicuous, subepidermal, almost wholly immersed, honey-yellow becoming dark-brown, flask-shaped, 80–110 μ broad by 80–100 μ high; ostiolar filaments 40–55 μ long.

I. Aecia hypophyllous, gregarious, crowded, cylindrical, long; peridium pale-yellow, margin erect, lacerate, peridial cells rhomboidal, 32–48 μ long, considerably overlapping, outer wall much thickened, 10–15 μ, transversely striate, inner wall thinner, 4–5 μ, moderately verrucose; aeciospores globoid, often angular, large, 23–26 by 27–33 μ, wall pale cinnamon-brown, thick, 3–4 μ, moderately verrucose.

On *Senecio salignus* DC., Hacienda of San Joaquin, District of Tulancingo, State of Hidalgo, Mexico, May, 1906, *A. L. Herrera* of the Comision de Parasitologia Agricola; communicated by E.

W. D. Holway. A very conspicuous aecium on account of its long peridium, and the large, dark-colored spores.

Aecidium Sorbi sp. nov.

O. Pycnia epiphyllous, numerous, gregarious, in small groups on discolored areas, noticeable, subepidermal, honey-yellow becoming brownish, conoidal, 110–130 μ in diameter, 70–80 μ high; ostiolar filaments 30–45 μ long.

I. Aecia hypophyllous, numerous, gregarious, in small groups of 4 to 7, arising from slight swellings on discolored spots, or often more numerous on larger swellings on the veins or rachis, cupulate, 0.2–0.4 mm. high by 0.2–0.3 mm. across; peridium colorless, margin nearly erect, erose, peridial cells rhomboidal, 30–45 μ long, slightly overlapping, lumen small, outer wall much thickened, 10–13 μ, transversely striate, smooth, inner wall thinner, 3–5 μ, somewhat striate, moderately verrucose; aeciospores broadly ellipsoid, usually somewhat angular, 23–27 by 27–39 μ, wall colorless, thick, 3–4 μ, minutely verrucose.

On *Sorbus occidentalis* (Wats.) Greene, Hodag Lake, Vancouver Island, British Columbia, Canada, August 8, 1905, *F. K. Butters;* communicated by E. W. D. Holway. A very distinct species of *Aecidium*, and especially interesting as it is the second one so far known on a pomaceous host.

Aecidium pulverulentum sp. nov.

O. Pycnia epiphyllous, numerous, gregarious, in rather small indeterminate groups, not crowded, conspicuous, punctiform, subcuticular, becoming blackish-brown, hemispherical, 80–140 μ in diameter, 40–50 μ high; without ostiolar filaments; pycniospores numerous above a flat hymenium.

I. Aecia hypophyllous, numerous in indefinite groups, not much crowded, cylindrical, deep-seated, small, about 0.1 mm. in diameter, pulverulent; peridium colorless, evanescent, peridial cells rather thin, 30–45 μ long, overlapping, easily separating, outer wall smooth, inner wall rather coarsely verrucose; aeciospores angularly globoid or ellipsoid, or elongate-polyhedral, sometimes broader above, 23–29 by 24–32 μ, wall light cinnamon-brown fading to almost colorless, thick, 3–5 μ, much thicker above, 7–13 μ, noticeably and strongly verrucose.

On *Randia sp.*, Cuernavaca, State of Morelos, Mexico, October 30, 1903, *E. W. D. Holway 5275* (type); Chapala, State of

Jalisco, Mexico, October 5, 1903, *Holway 5115*. The two collections are apparently on different species of *Randia*. This is a peculiar form of rust. From the subcuticular pycnia, the unusually small aecia, and the strongly verrucose spores it is evident that it does not belong under the *Dicaeomatae, i. e.*, to any of the usual forms of *Puccinia* or *Uromyces;* but its true affinities are not apparent.

PURDUE UNIVERSITY,
LAFAYETTE, INDIANA.

Notes on the distribution of some Alabama plants

ROLAND M. HARPER

From November, 1905, to July, 1906, I was doing botanical field work for the Geological Survey of Alabama, and in the course of my travels over the state, which took me into nearly every county, I found many plants in unexpected places. Some of those discussed below have not been reported from Alabama before, but few are mentioned for that reason alone. The mere fact of extending the known range of a species a short distance across some political boundary or parallel of latitude, in a region where botanists are as scarce as they are in Alabama, is not ordinarily of sufficient importance to justify publishing it, but if at the same time some new light is thrown on the laws of distribution, then the case may be different. Several of the following species are here reported for the first time from natural regions which they were not previously known to occupy, which will necessitate more or less readjustment of existing theories of their distribution. Some notes of this kind from the northern part of the state, mentioning two species new to Alabama, were published in Torreya for June, 1906.

ANCHISTEA VIRGINICA (L.) Presl (*Woodwardia* J. E. Smith)

Hitherto this has been known only in the glaciated region and coastal plain of the Eastern United States,* but last spring I found it in damp woods in the Coosa valley near Center, in Cherokee County, and in the metamorphic (eastern) part of Chilton County, a few miles from the same river. Although the finer details of geological history in the southeastern states are still very imperfectly known, there are several reasons for believing that much of the country adjacent to the Coosa River throughout its length was submerged beneath the sea during the Tertiary period, or later, and the vegetation of this area must therefore be much newer than that of most of the Metamorphic and Palaeozoic terranes.

* See Rhodora 7 : 71. 1905.

PINUS SEROTINA Michx.

In Georgia this pine can be found almost anywhere in the coastal plain except in the lime-sink region, but the only previous record of its occurrence in Alabama which I have come across is on page 192 of Mohr's Plant Life, where it is cited as the host of a fungus collected in Lee County by Professor Atkinson. (And even this is an error, according to Arthur and Kern.)* Last winter I found this tree in Chilton County near Thorsby, in Autauga between Prattville and Booth (these two localities being in the region of the Tuscaloosa formation, corresponding approximately with the fall-line sand-hills of Georgia and the Carolinas), in the southeastern corner of Dale, and at several places in Houston, Geneva and Covington (the last three counties being in the pine-barren region, along the southern border of the state). There can be little doubt that it will eventually turn up in many other places in the southeastern quarter of the State. Just what keeps it from extending farther west I am unable to say.

In the last chapter of the revised edition of Mohr's Timber Pines of the Southern United States (1897) is an excellent summary of the known distribution of this species up to that time, by Dr. F. Roth.

TSUGA CANADENSIS (L.) Carr.

Geographical names are sometimes of considerable assistance in discovering little known geological, botanical or historical facts. The name "spruce pine" is applied by the natives to several different coniferous trees in the South, but in the mountains it usually means either *Tsuga canadensis* or *Pinus virginiana*. On March 30 last I happened to be passing through the village of Spruce Pine, in Franklin County, and not seeing any of the latter species in the vicinity, and being out of the known range of *Tsuga*, I inquired as to the origin of the name, and was told that it was derived from a tree similarly named, more rarely called hemlock, which grew wild near by, some of it being within a mile to the westward. Having about an hour to spare before train-time, I hastened in the direction indicated, following down a branch †

* Bull. Torrey Club 33: 415. August, 1906.

† See Ann. N. Y. Acad. Sci. 17: 24 (footnote). 1906.

which headed near the station, and after going a little over a mile found a group of four trees on the steep bank of the branch. On my return to the station with the desired specimens I was told further that the species extends down the same stream about twenty miles (which would bring it almost to the Mississippi line), and that some of the specimens are three or four feet in diameter.

Tsuga canadensis is known from only two other counties in Alabama, namely, Winston, where it was found by Judge Peters and Dr. Mohr,* and Jackson, where Mr. Harbison reported it a few years ago. † All of the Alabama stations are on the sandstone rocks of the Coal Measures, and not far from 1,000 feet above sea-level.

TAXODIUM DISTICHUM (L.) Rich.

It was quite a surprise to find this tree growing on granite rocks along and in the shoals of the Tallapoosa River for a mile or two above the fall-line at Tallassee, amid typical Piedmont region scenery, with not a trace of any coastal plain deposits in sight; for it is almost confined to the coastal plain, and to calcareous formations. I measured one specimen 33 inches in diameter above the enlarged base. With it were several other species of somewhat similar distribution, but I did not have time to ascertain how far up the river any of them extended. To explain their occurrence there will require a knowledge of some details of geological history which are as yet unwritten; but the plants themselves may be expected to furnish important clues when the laws of their distribution are better understood.

SCIRPUS CARINATUS (H. & A.) Gray

Dr. Mohr knew of no definite Alabama station for this species, but last spring I found it to be a common weed along damp roadsides, etc., in or near Tuscaloosa, Auburn, Tuskegee, Prattville, Elmore, Clanton and Maplesville. It flowers in April, and is probably more difficult to recognize at other seasons of the year. It is evidently introduced, and its natural range is yet to be determined.

* See his remarks on this species on pages 34 and 72 of his Plant Life of Alabama.
† Biltmore Bot. Stud. 1: 154. 1902.

SCIRPUS GEORGIANUS Harper, Bull. Torrey Club **27**: 331. *pl. 22.* 1900

Quite abundant in a marshy place near Wellington, Calhoun County (in the Palaeozoic region), May 17, in flower. Previously known only from two or three places in Middle Georgia.* During the same month I saw from trains in Tuscaloosa and one or two other counties what is probably the same species, though some of it may have been *S. atrovirens* Muhl., which is likewise unrecorded from Alabama.

RYNCHOSPORA SEMIPLUMOSA Gray

As this species was originally described from Louisiana and is common in the pine-barrens of Georgia, it was to be expected in Alabama. In June I found it in moist pine-barrens within a few miles of Geneva and Andalusia.

CAREX PICTA Steud.

This has always had the reputation of being rare, but probably chiefly because it flowers in March, when not many botanists are stirring in the regions where it grows. Last spring I found it in six counties, namely, Lauderdale, Colbert, Marshall, Blount, Walker and Fayette. Dr. Mohr knew it only from Winston. Its usual habitat is on shaded bluffs of the Coal Measures and other non-calcareous Carboniferous strata.

RHAPIDOPHYLLUM HYSTRIX (Pursh) Wendl. & Drude

This has been known to Alabama botanists from only one station, in the vicinity of Auburn. On a visit to Evergreen, in Conecuh County, last December, I found that it forms an important asset of the shippers of Christmas decorations at that place,† so I instituted a search for it in the vicinity, and found it at two places a few miles apart. On a remote and almost inaccessible island in a creek swamp, which the evergreen hunters must have so far overlooked, were many fine specimens. In June I saw a few leaves being carried in a

* See Bull. Torrey Club **28**: 466. 1901. — Later. Mr. Fernald (in Rhodora **8**: 163–164. 1906) has just announced a much wider distribution for it.

† See Country Life in America **7**: 171–176. Dec., 1904. The palms in the picture in the lower left-hand corner of the first page are *Rhapidophyllum.*

buggy which I met a few miles from Greenville, in the next county above, but I did not learn where they were gathered. It is rather unfortunate that this species should be in demand for decorative purposes, for it is the rarest palm in the Eastern United States outside of subtropical Florida, and it is liable to be exterminated from some places before the laws of its distribution can be fully worked out.

Dryopteris floridana, which likewise has been reported in Alabama only from the vicinity of Auburn, is also shipped from Evergreen for the same purpose, but I did not succeed in finding any of it growing.

ERIOCAULON LINEARE Small

On May 15th a few specimens were noted in a boggy place in the Coosa valley about two miles from Center, in Cherokee County, together with *Anchistea virginica* and several other species rarely seen outside of the coastal plain. It was previously known only from the pine-barrens of Georgia.*

LUZULA SALTUENSIS Fernald

(*Juncoides pilosum* of other recent American authors)

This has much the same habitat as *Carex picta*, and flowers at the same time. I noted it last spring in Lauderdale, Colbert, Fayette, Tuscaloosa, Cleburne and Chilton Counties, all in the upper half of the state, in the Palaeozoic and Metamorphic regions. It is not mentioned in Mohr's Plant Life or in Earle's Flora of the Metamorphic Region of Alabama.†

TILLANDSIA USNEOIDES L.

Professor Earle ‡ reported this as having been all killed in the Metamorphic region of Alabama by the freeze of February, 1899; but I was gratified to find last April that his estimate of the damage was somewhat exaggerated. There is a good deal of this plant growing on trees among the granite cliffs along the Tal-

* See Bull. Torrey Club **32**: 461–463. 1905.

† For notes on its occurrence in Georgia see Bull. Torrey Club **27**: 324, 325. 1900; **32**: 154, 452. 1905.

‡ Bull. Ala. Agric. Exp. Sta. **119**: 63. 1902.

lapoosa River near Tallassee (the same locality mentioned above in connection with *Taxodium distichum*). Many of the specimens observed there and in the neighboring Cretaceous region are dead, however, and it is probable that those now living came from seeds which managed to survive the freeze.

The occurrence of this species there at all was somewhat of a surprise, for it is almost confined to the coastal plain, barely entering the Metamorphic region for a couple of miles at its extreme southern edge in Georgia and Alabama, about latitude 32° 30′. Just why the inland edge of the range of an epiphyte should so nearly coincide with a geological boundary is an unsolved problem. It is significant in this connection that it shows a decided preference for trees growing in calcareous soil (as was noted by Dr. Hilgard in Mississippi in 1860 and by Dr. Smith in Alabama in 1894); but the reason for this is equally obscure.

UVULARIA FLORIDANA Chapm.

Collected in the bottoms of Catoma Creek about five miles southwest of Montgomery, April 23, 1906. This species is not mentioned by Dr. Mohr, but there is a specimen in the Torrey Herbarium collected by Buckley in May, 1841, in Alabama, locality not specified, but presumably in Wilcox County, like most of Buckley's other Alabama plants.*

MYRICA CAROLINENSIS Mill.

In habitat and distribution this is very similar to *Anchistea virginica*, already mentioned.† In Alabama I have noted it in eight coastal plain counties, also in sandy bogs in Marshall (on Sand Mountain), Cherokee (Coosa valley), Clay, Chilton and Tuscaloosa counties, in the older parts of the state. The specimens at these places, however, are very small, being scarcely more than knee-high.

The explanation suggested for the occurrence of *Anchistea* outside of the coastal plain will not apply so well to this case, for the Marshall and Clay County stations at least have in all probability

* See Mohr, Contr. U. S. Nat. Herb. 6: 16. 1901.

† See also Rhodora 7: 74. 1905.

been dry land since a time antedating the appearance of all species of dicotyledons now living.

It now seems as if practically all the bog plants common to the glaciated region and coastal plain can be found in at least a few places in the older regions between, and perhaps they were all once more widely distributed there, and are being gradually crowded out into the newer regions by the climax vegetation.*

QUERCUS LAURIFOLIA Michx.

Until this year this too was known only from the coastal plain, but during the spring I found it quite abundant along the Coosa River in Chilton and Coosa counties, in the Metamorphic region, also along streams at several places in the Coal Measures, particularly in Bibb County around Blocton, in the upper (northeastern) part of Tuscaloosa County, and in Walker County near Cordova, Cedrom † and South Lowell. It is doubtless slowly retreating from the highlands, like several other species mentioned in this paper. To determine where it reached its maximum inland extension, and at what geological period, would be a most interesting problem, but I can suggest no way of solving it at present. The fact that at all the localities above mentioned, except those near Cordova and Cedrom, *Pinus palustris* is common on the neighboring hills, is perhaps worth remembering.

In the coastal plain *Quercus laurifolia* is common in most of the counties, but rather avoids the Cretaceous prairies and other calcareous regions where climax vegetation prevails. Dr. Mohr's remarks about this species and *Q. Phellos* on page 473 of his Plant Life show that he had the two species partly confused, for the latter is one of the commonest trees in the prairie region, where *Q. laurifolia* is almost unknown. The two trees are indeed difficult to distinguish in summer, but in winter and early spring (at which seasons most of my observations on Alabama trees were made) they are very distinct.

---

* Some interesting suggestions along this line are found in Mr. Kearney's paper in Science for Nov. 30, 1900, though he seeks the cause of the phenomena in changes of climate, which must have played a relatively unimportant part, and moreover are largely hypothetical.

† A small station on the Frisco System, between Townley and Pocahontas.

PARONYCHIA RIPARIA Chapm.

SIPHONYCHIA PAUCIFLORA Small

These two species, new to the state, I found on sandy banks of rivers near Geneva the latter part of June.

MAGNOLIA GLAUCA L.

This tree has long been known to occur in the Metamorphic and Palaeozoic regions of Georgia and Alabama,* but it may be worth mentioning that I have recently found it still farther from the coast than it is usually seen. It grows on Sand Mountain in Marshall County near Albertville (some of the specimens there reaching a diameter of nine inches and a height of about fifty feet), on Lookout Mountain (a foot in diameter) as well as in the Coosa valley in Cherokee County, and in Blount County near Oneonta. The Sand and Lookout Mountain localities are between 900 and 1100 feet above sea-level. (Dr. Gattinger reports it from Madison County, Tennessee, which is still farther inland, but in the coastal plain.)

In the western part of the state, in the Tuscaloosa region of the coastal plain, this species is very common in the southern part of Marion County, up to latitude 34°, and the largest specimen I have ever seen, three feet in diameter, is in the western part of Fayette County, a little outside of the range given on Dr. Mohr's map.

The geological history of *Magnolia glauca* is probably similar to that of *Myrica carolinensis*, with which it often associates.

ILLICIUM FLORIDANUM Ellis

The range usually given for this species, "Florida to Louisiana," might lead uninformed persons to believe that it is found only near the coast. But in Alabama it has a pretty wide distribution, and is not even confined to the coastal plain. It seems to be most common in the region of the Tuscaloosa formation, in Marion, Lamar, Pickens, Tuscaloosa, Bibb, Chilton, Autauga, Elmore and Macon counties. In Chilton County it is also com-

* The northern boundary of its range in Alabama as known to Dr. Mohr is mapped on the frontispiece of his Plant Life.

mon along streams in the metamorphic region near the Coosa River; and it has recently been reported from Coosa County, on the other side of the river, by F. W. Reed.*

Like several other southern evergreens now nearly confined to the coastal plain, this in all probability formerly grew in the mountains farther north, where there is no longer any trace of it. The fact that it has near relatives in eastern Asia is doubtless of some significance in this connection. Its habitat is difficult to describe, and not exactly like that of any other species known to me. It grows normally neither in swamps nor in hammocks, but just on the border line between them. A peculiarity of its range is that no one seems to have ever seen it in Georgia, though in Macon and Dale counties it is not very far from there, and Professor Earle reports it from Lee County, which is still nearer. Bartram's observations on this species (summarized in Mohr's Plant Life, pp. 14, 15) are worth reading.

HEPATICA ACUTILOBA DC.

Seen in March, in flower, on shaded Subcarboniferous bluffs in Marshall, Madison and Colbert counties. Near Riverton, in the last-named county, it grows within a mile or so of the Mississippi line, and it could doubtless be found on the Palaeozoic hills of that state also, though it does not seem to have been hitherto reported west of Georgia and south of Tennessee. Having found it near Riverton I naturally expected to find it also in the vicinity of Florence, a little farther up the Tennessee river; but strange to say, the *Hepatica* there seems to be all *triloba* (as I was told before I looked for it by Professor M. C. Wilson, a local botanist).

Judging from a remark in Gattinger's Tennessee Flora, and observations which have been made by other botanists, the exact relationship between these two supposed species of *Hepatica* deserves looking into, and might well be made the subject of statistical and experimental studies.

JEFFERSONIA DIPHYLLA (L.) Pers.

In rich woods on the limestone at the northern base of Sand Mountain, near the Tennessee River, a few miles east of Gunters-

* U. S. Forest Service Bull. **68**: 11, 47. 1906.

ville, Marshall County, March 22, 1906, in flower. Not previously reported south of Tennessee.

ARABIS GEORGIANA Harper, Torreya 3: 88. 1903

Previously known only from the banks of the Oostanaula and Chattahoochee rivers in Georgia.* On December 9th last I was walking along the Coosa River (a continuation of the Oostanaula), in the upper edge of the coastal plain in Elmore County, a few miles below Wetumpka, and thinking that this species should grow there if anywhere in Alabama, I looked for it at the first promising spot — and found it, of course in the same condition in which I had last seen it in Georgia. On April 24 I revisited the locality and was fortunate in finding my plant in full bloom — the first time it had ever been seen in that condition in the wild state, by the way. Its habitat and associates there are very much the same as at the two Georgia stations.

PARNASSIA ASARIFOLIA Vent.

A few years ago I supposed that this species reached its southern limit in Clarke County, Georgia.† But Dr. Mohr‡ has since reported it from Clay County, Alabama, and last spring I saw it in wet woods in the counties of Cleburne, Randolph and Chambers, which are likewise in the Metamorphic region.

NEVIUSIA ALABAMENSIS Gray

As is well known, this is one of the rarest of North American shrubs. It was known only from the vicinity of Tuscaloosa§ until Mr. T. G. Harbison found it at the northwestern base of Sand Mountain in Jackson County a few years ago.‖ On March 23 I saw it on limestone rocks on the lower slopes of the mountains east of New Market, Madison County, about five miles from the Tennessee line, on the same formation (Subcarboniferous) as that on which Mr. Harbison found it.

---

* See Torreya 4: 24. 1904.
† Bull. Torrey Club 27: 324, 335. 1900.
‡ Contr. U. S. Nat. Herb. 6: 535. 1901.
§ See Plant World 3: 136. 1900; 9: 105. 1906.
‖ Biltmore Bot. Stud. 1: 155. 1902.

BAPTISIA BRACTEATA Muhl.

Seen in April and May on several dry rocky ridges in Cleburne, Calhoun and Talladega Counties, near the rather ill-defined boundary between Metamorphic and Palaeozoic. Associated in every case with *Pinus palustris* and other species of somewhat similar distributiion. Previously known only from eastern Middle Georgia.

POLYGALA NANA (Michx.) DC.

Since reporting this from DeKalb County* I have seen it in many other places in the upper parts of the state, particularly in Marshall, Etowah, Blount, Walker, Talladega and Chilton Counties. It occurs usually in dry woods, associated with *Pinus palustris* (except on Sand and Lookout Mountains, where this pine is not found), and grows scatteringly, rarely more than half a dozen specimens being visible at once. In Georgia, where it seems to be confined to the pine-barrens, I have not seen this species within fifty miles of the fall-line. Whether or not its irregular distribution follows approximately the same laws as that of *Myrica carolinensis* and other species mentioned above is an open question.

STAPHYLEA TRIFOLIA L.

Probably the only coastal plain stations on record for this species are in Quitman and Decatur counties, Georgia, along the Chattahoochee River.† But on April 23 I found many specimens along Catoma Creek in Montgomery County, some of them about three inches in diameter and twenty feet tall, which seems to be the maximum height recorded for this species, though not the maximum diameter.‡

CIRCAEA LUTETIANA L.

In rich woods along Chickasawbogue Creek on the road from Linden to Demopolis, Marengo County (Cretaceous region of the coastal plain), June 28. This station is of interest as being the first recorded in the coastal plain (at least in the South), as well as the southernmost by a good many miles.

---

* Torreya **6**: 113, 115. 1906.

† See Bull. Torrey Club **32**: 162, 163. 1905.

‡ See Torreya **5**: 164. 1905.

? RHODODENDRON CUTHBERTII Small

At several places in the eastern (Metamorphic) part of Chilton County, on banks of streams, is a *Rhododendron* which a few years ago would have been pronounced without hesitation *R. punctatum* Andr.; but without flowers I have no way of distinguishing it from *R. Cuthbertii* Small,* a recently described species. Neither is mentioned in Mohr's Plant Life, but *R. punctatum* is reported from Tallapoosa County by Professor Earle† and from Eufaula by Dr. Chapman.‡ Professor Earle's plant is doubtless the same as mine and as one which grows among the Pine Mountains of western Middle Georgia, and Dr. Chapman's the same as one in the Eocene region of Southwest Georgia,§ but whether the two are identical or not cannot be determined at present.

PIERIS PHILLYREIFOLIA (Hook.) DC.

Dr. Mohr knew this only as a diminutive shrub in the pine-barrens of Mobile County; but last December I saw it in cypress ponds near Gordon and Cowarts, in Houston County, and around the lake near Florala, in Covington County, climbing the trees in the same unique manner that I noticed in Georgia a few years ago.‖

ADELIA ACUMINATA Michx.

In view of the fact that this species, like many others of alluvial habitat, extends up the Mississippi valley embayment of the coastal plain to southern Illinois,¶ it is not surprising that it should occur along the Tennessee river near Florence, though that is a little out of the coastal plain. (The same remarks will apply to *Taxodium distichum*, *Planera aquatica* and *Brunnichia cirrhosa* as well.) When I saw it there, on the 29th of March, it was just beginning to flower. The specimens were quite numerous and mostly above

---

* Torreya **2**: 9. 1902.

† Bull. Ala. Agric. Exp. Sta. **119**: 97. 1902.

‡ Fl. So. U. S. ed. 3. 288. 1897.

§ See Bull. Torrey Club **33**: 240. 1906.

‖ Torreya **3**: 21, 22. 1903.

¶ S. M. Coulter, Rep. Mo. Bot. Gard. **15**: 53, 54. *pl. 10.* 1904; H. A. Gleason, Torreya **6**: 8. 1906.

the average size, some being about 25 feet tall, with trunks 6 inches in diameter.

OSMANTHUS AMERICANUS (L.) B. & H.

In Alabama as well as in Georgia this evergreen shrub or small tree is by no means confined to the immediate vicinity of the coast, as was thought to be the case up to a few years ago.* It occurs at a number of places in the Eocene region, and extends inland to Chilton, Autauga and Elmore Counties, growing along streams in the metamorphic portion of the first-named, like *Illicium floridanum*. (It has also been found in Lee County.)† Like *Illicium* again, it has a number of Asiatic relatives, and may have had a similar history.

TRACHELOSPERMUM DIFFORME (Walt.) Gray

Still another coastal plain plant found occasionally in the upper districts. Dr. Mohr has already reported it from Morgan and Walker counties, and on May 13 I found it at two or three places along the Calvert Prong of the Locust Fork of the Warrior River in Blount County, on upper Carboniferous strata (Coal Measures). This too has Asiatic relatives, like the preceding.

In Georgia I have found this species almost always along streams which have passed through calcareous regions,‡ and this new Alabama station for it is no exception to the rule. For although the Calvert Prong runs lengthwise of Sand Mountain, occupying the synclinal trough of the plateau, like several other streams,§ it has some tributaries entering above the point in question which rise in the limestone valley on the southeast and flow into the mountain.‖ This peculiar type of drainage I have not met with anywhere else than in Blount County.

---

* See Bull. Torrey Club **30**: 338. 1903.

† What is perhaps the first specimen of this species collected in the Metamorphic region was distributed by Professor and Mrs. Earle (*no. 56*), and is labeled "Occasional, usually along streams, often on rocky banks. Auburn, Lee Co., April 11, 1900."

‡ See Ann. N. Y. Acad. Sci. **17**: 69, 70, 175. 1906.

§ See Torreya **6**: 112, 114. 1906.

‖ This is very well shown by the map of Blount County in the report of the field operations of the U. S. Bureau of Soils for 1905, taken in connection with the topographic maps of the same region, published by the U. S. Geological Survey.

CHRYSOPSIS OLIGANTHA Chapm.

In rather dry pine-barrens, Geneva and Covington counties. Nearly past flowering in the latter part of June, when I collected it, differing notably in this respect from the somewhat similar *C. graminifolia*, which flowers from August to November in Georgia.

ANTENNARIA SOLITARIA Rydb.

Like *Carex picta* and *Luzula saltuensis*, this is frequent on shaded non-calcareous bluffs in the upper half of the state. I have noted it in Lauderdale, Colbert, Franklin, Limestone, Marshall, Cherokee, Cleburne and Chilton counties. It is not mentioned by Chapman, Mohr, Harbison or Earle, which is strange, for it is a very distinct species, and can be easily recognized any day in the year.*

MESADENIA SULCATA (Fernald) Small

In and near branch-swamps in the pine-barrens, Geneva and Escambia counties. Previously known only from Southwest Georgia and West Florida,† and possibly also from South Carolina.‡

* For notes on its occurrence in Georgia see Bull. Torrey Club **28**: 482. 1901; **30**: 294. 1903; **32**: 169. 1905.

† See Bull. Torrey Club **30**: 342. 1903; **31**: 27. 1904.

‡ See Torreya **5**: 183. 1905.

Notes on Calochortus

CHARLES VANCOUVER PIPER

In the Proceedings of the Academy of Natural Sciences of Philadelphia, for 1868, Professor Alphonso Wood described *Calochortus elegans nanus* based on specimens collected on "High Hills, Yreka. Also on Mt. Hood." In Dr. Sereno Watson's treatment of the genus (Proc. Am. Acad. vol. **15**), Professor Wood's subspecies is recognized and *C. Lyallii* Baker, Jour. Linn. Soc. **14**: 305, is cited as a synonym. The Mt. Hood plant has since been collected several times, and in Howell's Flora of Northwest America is well described under the name *C. Lyallii* Baker. Wood's name, *C. elegans nanus*, is common on herbarium specimens, but without exception all such specimens seen are merely small plants of true *C. elegans* Pursh, and have nothing to do with the original specimens of Wood.

To clear up the confusion an endeavor was made to find Wood's type specimens, but according to Dr. H. H. Rusby these are not now to be found in Wood's herbarium. Specimens of both collections are, however, in the Gray Herbarium labeled respectively "Mts. W. of Yreka, June, 1866" and "Mount Hood, August 20, 1866."

A study of these specimens reveals two entirely distinct species, both of which are distinct from *C. Lyallii* or any other described species. The following descriptions and notes will make clear the confusion which has existed.

Calochortus nanus (Wood)

Calochortus elegans nanus Wood, Proc. Acad. Phila. **1868**: 168. 1868.

Bulbs ovate, deep-seated, 2–3 cm. long: stems erect, 10–15 cm. long, exceeded by the solitary leaf, 1–5-flowered: leaf linear or linear-lanceolate, acute, 10–25 cm. long, 2–7 mm. wide, not paler beneath: bracts lanceolate: sepals oblong-ovate, acute or acuminate, blue-tinged, 10–15 mm. long, thinnish, slightly arched at base, without spot at base: petals rhombic-ovate, faintly tinged with blue, evenly hairy all over the inner face and ciliate, 15–18

mm. long; scale about one third as broad as the petal at its place of insertion, nearly semicircular, but little incised: stamens one third as long as petals, the acuminate anthers as long as the flattened filaments: style short: capsules nodding, orbicular when mature, 1.5 cm. long.

This species is nearer true *C. elegans* Pursh than any other Californian species. It is most easily distinguished by the character of the scale, which in *C. elegans* is half as wide as the petal or more, and deeply laciniate into many narrow segments.

The original specimens of Wood are very slender, but later collections show that the species becomes at least as large as *C. elegans*. The species seems to be rare and is not accounted for apparently in any recent treatment of the genus. Only the following specimens have been seen:

"Mts. W. of Yreka," *A. Wood 967*, June, 1866.

Castle Crags, in pine woods, *Piper 6398*, May 30, 1904.

Sissons, in dry woods, *Applegate 725*, May 28, 1895.

Siskyou Mountains at the summit, *Howell*, June 16, 1884.

The last locality may be in Oregon; the others are in California.

CALOCHORTUS SUBALPINUS Piper, Contr. U. S. Nat. Herb. 11: 195. 1906

Bulbs ovate, 2–3 cm. long, the outer coats dark: stems flexuous, erect, 15–20 cm. high, usually exceeded by the solitary leaf, 1–3-flowered: leaf linear-lanceolate, acuminate, 3–8 mm. wide, paler beneath: bracts lanceolate, long-acuminate, 2–3 cm. long: sepals lance-ovate, acuminate, somewhat scarious on the margins, 1.5–2.5 cm. long, 6–9-nerved, the base strongly arched, forming a shallow pit inside, this marked by a purple spot: petals cream-colored, purplish at base, obovate or rhombic-orbicular, 2–3 cm. long, slightly erose at margin, sparsely villous over the upper face above the striate, minutely puberulent gland, excepting a narrow portion near the apex; scale narrow, entire, extending in a gentle curve nearly across the petal and covered with long retrorse hairs: filaments broadly wing-margined, equaling the long-beaked anthers: capsules nodding, narrowly elliptical, rather acutish at each end, 2–3 cm. long, beaked by a style 1–2 cm. long.

A subalpine species, closely allied to *C. Purdyi* Eastwood, which differs in having thinner sepals lacking the pit at base;

more villous petals without the naked apical area; less villous scales which are very strongly arched; a much thinner, perfectly smooth gland; and merely acuminate, not beaked anthers.

Specimens of this species have been examined as follows:

WASHINGTON: Mount St. Helens, *Coville 765*, July 18, 1898; Mount Adams, *Henderson 52*, 1883; Klickitat river, *Flett 1124*; High mountains, Skamania County, *Suksdorf*, August 11, 1886; White Salmon, *Suksdorf*, 1879; Falcon Valley, *Suksdorf*, July 1, August, 1881; Falcon Valley, *Suksdorf*, 700 m. alt., 1879.

OREGON: Mount Hood, *A. Wood*, August 20, 1866; *Mrs. P. G. Barrett*, snow line, September, 1882; *Gorman*, September 23, 1896; *C. H. Merriam*, alt. 2000–2300 m., 1896; *Howell*, 1881; *M. A. Barber 230*, alt. 2500 m., August 26, 1899. Three Sisters, *Gorman 121*, July 21, 1903, alt. 2000 m.

This species has been mistaken for *C. apiculatus* Baker, but that has no scale on the petal. Specimens of this species sent to the British Museum have been compared with the type of *C. elegans Lobbii* Baker, Jour. Linn. Soc. **14**: 305, by Mr. C. H. Wright, who reports that the two are identical. This species is however very different from *C. Lobbii* Purdy, Proc. Calif. Acad. III. **2**: 122, which Purdy states was identified by Baker himself as his *C. elegans Lobbii*. A regrettable confusion has thus arisen in the synonymy through the use of the name *Lobbii* for two very distinct species.

CALOCHORTUS LYALLII Baker, Jour. Linn. Soc. **14**: 305. 1875

(Type collected by Lyall in "Columbia brittanica ad apicem montis alt. 5800 pedes inter fluv. Columbia et Yakima." This locality is the Wenache Mountains, Washington.)

Calochortus ciliatus Rob. & Seaton, Bot. Gaz. **18**: 238. 1893.

(Type in the Gray Herbarium, collected by Brandegee in the "Wenatchie Region.")

This species occurs in the Wenache and adjacent Cascade Mountains in Washington. It has been collected as follows:

Wenache Region, *Brandegee 1107*, 1883; Naches River, *Henderson 2485;* Wenache Mountains, *Whited 40* and *1139*, *Cotton 1266, 1313, 1657; Vasey 82*, 1892; Mount Stuart, *Sandberg &*

Leiberg 575; Peshastin, *Sandberg & Leiberg*, July, 1893; "North Branch of the Columbia," *Wilkes Expedition 1068*.

Specimens collected by Cotton have kindly been compared for me with the type of *C. Lyallii* by Mr. E. G. Baker, who states that they differ only in the relative length of the anthers to filaments. This character, however, varies with age. The species is very distinct from *C. elegans* and its immediate allies in having erect pods. It may readily be recognized by its narrow, acuminate, jagged-margined petals which excepting the scale are glabrous or only sparsely pilose, and by its abruptly subacute anthers. Thus far the species has been found only in Chelan, Kittitas and Yakima Counties, Washington.

CALOCHORTUS ELEGANS Pursh, Fl. Am. Sept. 240. 1814.

This is the type species of the genus and was collected by Lewis "on the headwaters of the Kooskoosky, Idaho." The exact locality was at Lewis and Clark's spring camp of 1806, opposite the present site of Kamiah, Idaho. The species is common in pine woods in the Bitter-Root Mountains of Idaho and the Blue Mountains of Washington and Oregon up to 2000 meters altitude. It does not seem to reach the Cascade Mountains at any point. It varies considerably as do other species in the breadth of the solitary leaf and in the size of the flowers. The smaller and larger forms were long ago named by Hooker, in the Flora Boreali-americana, *C. elegans major* and *C. elegans minor*, but these seem unworthy of botanical recognition.

INDEX TO AMERICAN BOTANICAL LITERATURE
(1906)

The aim of this Index is to include all current botanical literature written by Americans, published in America, or based upon American material; the word America being used in its broadest sense.

Reviews, and papers which relate exclusively to forestry, agriculture, horticulture, manufactured products of vegetable origin, or laboratory methods are not included, and no attempt is made to index the literature of bacteriology. An occasional exception is made in favor of some paper appearing in an American periodical which is devoted wholly to botany. Reprints are not mentioned unless they differ from the original in some important particular. If users of the Index will call the attention of the editor to errors or omissions their kindness will be appreciated.

This Index is reprinted monthly on cards, and furnished in this form to subscribers, at the rate of one cent for each card. Selections of cards are not permitted; each subscriber must take all cards published during the term of his subscription. Correspondence relating to the card-issue should be addressed to the Treasurer of the Torrey Botanical Club.

Ames, O. Notes on orchids from Florida. Proc. Biol. Soc. Wash. **19**: 1, 2. 29 Ja 1906.

Anderson, J. P. Additions to the flora of Decatur County, Iowa. Iowa Nat. **2**: 7, 8. 31 My 1906.

Anderson, J. P. The flora of Lake Wabonsie. Iowa Nat. **2**: 9, 10. 31 My 1906.

Bailey, W. W. A newly introduced plant in Rhode Island. Torreya **6**: 189, 190. 27 S 1906.

Grindelia squarrosa.

Beauverd, G. Plantae Damazianae brasilienses, déterminées par différents botanistes. IV. Bull. Herb. Boissier II. **6**: 585–596. *f. 3, 4.* 30 Je 1906.

Includes new species in *Hippeastrum* and *Alstroemeria.*

Bergen, J. Y. & Davis, B. M. Principles of botany. i–x. 1–555. *pl. 1–13* + *f. 1–394* + *f. 1–8.* Boston, 1906.

Bernard, C. Sur la distribution géographique des Ulmacées. Bull. Herb. Boissier II. **6**: 23–38. 4 Ja 1906.

Blakeslee, A. F. Differentiation of sex in thallus gametophyte and sporophyte. Bot. Gaz. **42**: 161–178. *pl. 6* + *f. 1–3.* 2 O 1906.

Bruckman, L. Fasciations in *Arisaema, Rudbeckia* and *Viola.* Torreya **6**: 193–195. 27 S 1906. [Illust.]

Butters, F. K. The conifers of Vancouver Island. Postelsia **1906**: 133–212. *pl. 12–15.* 1906.

Cardot, J. Notice préliminaire sur les Mousses recueillies par l'Expédition antarctique suédoise. II. III. Bull. Herb. Boissier II. **6**: 1–17. 4 Ja 1906.

Includes descriptions of 24 new species in 14 genera.

Chaves, D. Parrafitos de geologia Nicaraguense y botanica Centroamericana. 1–30. Managua, Nicaragua, 1906.

Chodat, R. Observations sur le macroplancton des étangs du Paraguay. Bull. Herb. Boissier II. **6**: 143–147. *f. 6–10.* 31 Ja 1906.

Chodat, R. & Hassler, E. Novitates paraguarienses. Bull. Herb. Boissier II. **6**: 138–145. *f. 1–5.* 4 Ja 1906.

Euglypha Rojasiana gen. et sp. nov., and *Chodanthus* gen. nov.

Christ, H. Filices Brasiliae australis l. Leonidas Damazio. Bull. Herb. Boissier II. **6**: 294. 31 Mr 1906.

Elaphoglossum Damazii sp. nov.

Christ, H. Filices guatemalenses, ab H. von Türckheim 1904 lectae. Bull. Herb. Boissier II. **6**: 289–293. 31 Mr 1906.

Descriptions of 5 new species in 4 genera.

Christ, H. Primitiae florae costaricensis. Filices IV. Bull. Herb. Boissier II. **6**: 45–58. 4 Ja 1906; 159–172. 31 Ja 1906; 177–192. 28 F 1906; 279–288. *f. 1–13.* 31 Mr 1906.

Includes descriptions of 44 new species in 16 genera.

Cratty, R. I. Notes on the Iowa sedges I. Iowa Nat. **2**: 4, 5. 31 My 1906.

Davis, W. T. Aberrant forms of *Rudbeckia hirta* L. Proc. Staten Island Assoc. **1**: 35–37. 9 Jl 1906.

Davis, W. T. Botanical notes. Proc. Staten Island Assoc. **1**: 27, 28. 9 Jl 1906.

Dietel, P. Beschreibungen einiger neuer Uredineen. Ann. Myc. **4**: 303–308. 1 Au 1906.

Includes descriptions of 5 new American species, all in *Puccinia*.

Dowell, P. Botanical notes. Proc. Staten Island Assoc. **1**: 37–43. 9 Jl 1906.

Dowell, P. Distribution of ferns on Staten Island. Proc. Staten Island Assoc. **1**: 61–67. 9 Jl 1906.

Eaton, A. A. Pteridophytes observed during three excursions into southern Florida. Bull. Torrey Club **33**: 455–486. 5 O 1906.

Includes description of *Tectaria Amesiana* sp. nov.

Elmer, A. D. E. Philippine *Rubiaceae*. Leafl. Philipp. Bot. **1**: 1–41. 8 Ap 1906.

Includes descriptions of 45 new species in 20 genera.

Evans, A. W. *Hepaticae* of Vancouver Island. Postelsia **1906**: 213–233. 1906.

Fairman, C. E. *Pyrenomyceteae* novae in leguminibus *Robiniae*. Ann. Myc. **4**: 326–328. *f. 1–4*. 1 Au 1906.

New species in *Leptosphaeria*, *Metasphaeria* (2), and *Pleospora*.

Fitch, R. The action of insoluble substances in modifying the effect of deleterious agents upon the fungi. Ann. Myc. **4**: 313–322. 1 Au 1906.

Fitzpatrick, T. J. The Iowa gentians. Iowa Nat. **2**: 11–19. 31 My 1906.

Gager, C. S. Tuber-formation in *Solanum tuberosum* in daylight. Torreya **6**: 181–186. *f. 1*. 27 S 1906.

Greene, E. L. Certain rosaceous genera. Leaflets **1**: 237–244. 24 S 1906; 245. 17 O 1906.

Diagnoses of 7 new genera and several new species.

Greene, E. L. *Mitellastra* and *Rubacer*. Leaflets **1**: 229–236. 24 S 1906.

Greene, E. L. A new bland violet. Leaflets **1**: 247. 17 O 1906.

Viola minuscula sp. nov., from western New York.

Greene, E. L. An orchid note. Leaflets **1**: 237. 24 S 1906.

Greene, E. L. Some oriental *Rubus* allies. Leaflets **1**: 246. 17 O 1906.

Includes a new genus, *Calyctenium*.

Griggs, R. F. *Renfrewia parvula*, a new kelp from Vancouver Island. Postelsia **1906**: 245–274. *pl. 16–19*. 1906.

New genus and species.

Harper, R. M. A hitherto unnoticed relation between *Viola pedata* and *Iris verna*. Torreya **6**: 192, 193. 27 S 1906.

Hollick, A. An addition to the flora of Block Island. Torreya **6**: 190. 27 S 1906.

Botrychium obliquum.

Hollick, A. A fossil forest fire. Proc. Staten Island Assoc. **1**: 21–23. 9 Jl 1906.

Hone, D. S. Some western *Helvellineae*. Postelsia **1906**: 235–244. 1906.

House, H. D. Studies in the North American *Convolvulaceae*, II. The genus *Operculina*. Bull. Torrey Club **33**: 495–503. 5 O 1906.

Includes descriptions of 2 new species.

Huber, J. Revue critique des espèces du genre *Sapium* Jacq. Bull. Herb. Boissier II. **6**: 345–364. *f. 1–24.* 30 Ap 1906; 433–452. *f. 25–50.* 31 My 1906.

Includes descriptions of 16 new species.

Huber, J. La végétation de la vallée du Rio Purus (Amazone). Bull. Herb. Boissier II. **6**: 249–276. *pl. 8–13* + *f. 1–6.* 31 Mr 1906.

Kauffman, C. H. *Cortinarius* as a mycorhiza-producing fungus. Bot. Gaz. **42**: 208–214. *f. 1.* 2 O 1906.

Knowlton, F. H. Change of name. Proc. Biol. Soc. Wash. **19**: 95. 4 Je 1906.

Quercus Hatcheri for *Q. montana* Knowlton, not Willd.

MacDougal, D. T. Heredity and the origin of species. The Monist **16**: 32–64. Ja 1906.

Mathewson, C. A. The behavior of the pollen-tube in *Houstonia coerulea*. Bull. Torrey Club **33**: 487–493. *f. 1–3.* 5 O 1906.

Murrill, W. A. A new chestnut disease. Torreya **6**: 186–189. *f. 2.* 27 S 1906.

With a description of *Diaporthe parasitica* sp. nov.

Peck, C. H. Report of the State Botanist, 1905. N. Y. State Mus. Bull. 105: 1–106. *pl. S, T, 94–103.* Au 1906.

Includes descriptions of 17 new species of fungi in 16 genera; also a chapter on *Crataegus* found near Albany, by C. S. Sargent and C. H. Peck (here indexed separately).

Rehm, H. *Ascomycetes* novi. Ann. Myc. **4**: 336–341. 1 Au 1906.

Includes 6 new North American species in as many genera.

Rehm, H. Zum Gedächtnis an J. B. Ellis. Ann. Myc. **4**: 341–343. 1 Au 1906.

Rick, J. *Fungi* austro-americani fasc. III u. IV. Ann. Myc. **4**: 309–312. 1 Au 1906.

Includes 6 new species in as many genera: only one with diagnosis.

Robbins, W. W. Tubular ray-flowers in *Gaillardia aristata*. Torreya **6**: 190, 191. *f. 1–3*. 27 S 1906.

Rose, J. N. New names for two recently described genera of plants. Proc. Biol. Soc. Wash. **19**: 96. 4 Je 1906.

Harperella, for *Harperia* Rose, not Fitzgerald; *Neodonnellia*, for *Donnellia* Clarke, not Austin.

Rosendahl, C. O. Observations on plant distribution in Renfrew district of Vancouver Island. Postelsia **1906**: 1–132. *pl. 1–11*. 1906.

Sargent, C. S. & Peck, C. H. Species of *Crataegus* found within twenty miles of Albany. N. Y. State Mus. Bull. 105: 44–47. Au 1906.

Nineteen species are described as new.

Seward, A. C. & Ford, S. O. The *Araucarieae*, recent and extinct. Phil. Trans. Roy. Soc. Lond. **B 98**: 305–411. *pl. 23, 24* + *f. 1–28*. 27 Je 1906.

Shantz, H. L. A study of the vegetation of the Mesa region east of Pike's Peak: the Bouteloua formation, II. Development of the formation. Bot. Gaz. **42**: 179–207. *f. 8–13*. 2 O 1906.

Slosson, M. How ferns grow. i–vii. 1–156. *pl. 1–45* + *f. 1–9*. New York, 1906.

Smith, R. E. & E. H. A new fungus of economic importance. Bot. Gaz. **42**: 215–221. *f. 1–3*. 2 O 1906.

Pythiacystis citrophthora gen. et sp. nov.

Sprague, T. A. *Bignoniaceae* americanae novae. Bull. Herb. Boissier II. **6**: 371–376. 30 Ap 1906.

Descriptions of 9 new species in 4 genera.

Stephani, F. Species *Hepaticarum*, vol. II. Index. Bull. Herb. Boissier II. **6**: 59–77. 4 Ja 1906.

Stephani, F. Species *Hepaticarum*. Bull. Herb. Boissier II. **6**: 217–232. 28 F 1906; 377–392. 30 Ap 1906; 535–550. 30 Je 1906.

Includes 8 new American species in 4 genera.

Sydow, H. & P. Novae *Fungorum* species. Ann. Myc. **4**: 343–345. 1 Au 1906.

Includes 6 new American species in as many genera; one is the type of *Botryoconis* gen. nov.

Thom, C. Fungi in cheese ripening. Ann. Rep. Storrs Agr. Exp. Sta. **17**: 73–115. 1906.

Includes descriptions of *Penicillium Camemberti* sp. nov. and *P. Roqueforti* sp. nov.

Wieland, G. R. American fossil cycads. i–viii. 1–296. *pl. 1–50* + *f. 1–138*. Au 1906.

Carnegie Inst. Wash. Publ. no. 34.

Wilson, G. W. Mycological notes from Indiana. Torreya **6**: 191, 192. 27 S 1906.